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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/628,629	07/31/2000	Suhail S. Saquib	8445/RMD	3888

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POLAROID CORPORATION
PATENT DEPARTMENT
1265 MAIN STREET
WALTHAM, MA 02451

EXAMINER	
BHATNAGAR, ANAND P	
ART UNIT	**PAPER NUMBER**
2623	

DATE MAILED: 04/21/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No. 09/628,629	Applicant(s) SAQUIB, SUHAIL S.	
	Examiner Anand Bhatnagar	Art Unit 2623	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *30 January 2004*.

2a)☒ This action is **FINAL**. 2b)☐ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-49* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-49* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *07/31/00* is/are: a)☒ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☐ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

Response to Arguments

1. Applicant's amendment filed on 01/30/04 (paper #6) has been entered and made of record.

2. Applicant has amended claims 1, 30, 35, and 39. Claims 1-49 are currently pending.

3. Examiner withdraws the 35 USC 112, first paragraph, rejection for claims 1-6, 11-25, 35-40, and 45-49 and 35 USC 112, second paragraph, for claims 1-6, 11-19, 30-40, and 45-49 since claims 1, 30, 35 , and 39 have been amended to overcome these rejections respectively.

4. Applicant's arguments filed on 01/30/04 (paper #6) have been fully considered but they are not persuasive. Applicant's representative, in essence, argues on bottom half of page 26, in paper #6, that the applicant's method and apparatus of the applicant are directed to the selective attenuation of corruption in a digital signal, i.e. attenuate aliasing artifacts. This feature is nowhere in the claim language.

In response to applicant's argument that the references fail to show certain features of applicant's invention, it is noted that the features upon which applicant relies (i.e., "for selective attenuation of corruption in a digital signal",) are not recited in the rejected claim(s). Although the claims are interpreted in light of the specification, limitations from the specification are not read into the claims. See *In re Van Geuns*, 988 F.2d 1181, 26 USPQ2d 1057 (Fed. Cir. 1993).

Another argument, on page 28 of paper #6, made by applicant's representative is that the median filter of the applicant's instant invention is a non-linear median filter which is different than the one used in the prior art of Hau et al. (U.S. patent 5,528,301). Nowhere in the claim language of the applicant's instant invention is it stated that this is a non-linear type of median filter.

In response to applicant's argument that the references fail to show certain features of applicant's invention, it is noted that the features upon which applicant relies (i.e., "non-linear median filter",) are not recited in the rejected claim(s). Although the claims are interpreted in light of the specification, limitations from the specification are not read into the claims. See *In re Van Geuns*, 988 F.2d 1181, 26 USPQ2d 1057 (Fed. Cir. 1993).

5. Examiner refers to the rejection below.

Claim Rejections - 35 USC § 102

6. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

Claims 1, 2, 11, 12, 20, 21, 35, and 36 are rejected under 35 U.S.C. 102(b) as being anticipated by Hau et al. (U.S. patent 5,528,301).

Regarding claims 1, 20, and 35: Hau et al. discloses a method for filtering a digital input signal to produce a digital output signal (col. 1 lines 65-67 and col. 2 lines 1-4), the method comprising steps of:

(A) reducing a resolution of the digital input signal to produce a reduced resolution signal (fig. 1 element 12, col. 3 lines 55-57 and 64-67, and col. 4 lines 4-7 and 11-20, where the signal is decimated/reduced resolution by a factor of 2, 4, or 8);

(B) performing median filtering on the reduced resolution signal to produce a filtered reduced resolution signal (fig. 1 element 14 and col. 5 lines 24-28, where the decimated signal undergoes filtering through a bandlimiting filter. A median filter is a type of bandlimiting filter and is read as such.); and

(C) performing interpolation on the reduced resolution signal to produce the digital output signal (fig. 1 element 18 and col. 5 lines 29-30, where interpolation is performed on the filtered decimated signal).

Regarding claims 2, 21, and 36: The method wherein the step (A) comprises steps of:

(A)(1) performing linear filtering on the digital input signal to produce a filtered digital input signal (col. 5 lines 17 and 18, where the decimation of the signal takes place one line at a time which is read as linear filtering); and

(A)(2) down-sampling the filtered digital input signal to produce the reduced resolution signal (col. 5 lines 18-21, where the decimating process also

reduces the resolution from 1920 samples to 720 samples, which is read as resolution reduction).

Regarding claim 11: The method wherein the digital input signal comprises a signal corresponding to a chrominance channel of a digital image (col. 1 lines 5-9 and col. 2 lines 53-56, where the video/television signal is being converted. It is inherent that a video and or television signal is composed of luminance and chrominance components).

Regarding claim 12: The method wherein the digital input signal comprises a two dimensional signal (Tables 1-3, where the process of filtering is performed on a signal with horizontal and vertical components, i.e. two dimensional).

Claim Rejections - 35 USC § 103

7. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

A.) Claims 3, 22, and 37 are rejected under 35 U.S.C. 103(a) as being unpatentable over Hau et al. (U.S. patent 5,528,301) in view of Vetro et al. (U.S. patent 6,519,288).

Regarding claims 3, 22, and 37: The method wherein the step (A)(1) comprises:

a step of performing linear low-pass filtering on the digital input signal.

Hau et al. et al. discloses to perform filtering on a signal being inputted for format conversion (Hau et al.; fig. 1 elements 12, 14, and 18, and col. 5 lines 16-30). The filtering is to prevent aliasing to take place in the signal as it is being converted (Hau et al.; col. 3 lines 50-54). Hau et al. further teaches to perform linear filtering on the inputted signal (Hau et al.; col. 5 lines 16-18, where the signal is decimated one line at a time, which is read as linear filtering). Hau et al. does not teach to have this linear filtering being a linear low pass filtering process. Vetro et al. teaches to perform low pass filtering on a signal before it is downsampled to prevent aliasing (Vetro et al.; col. 13 lines 16-22). It would have been obvious to one skilled in the art to combine the teaching of Vetro et al. to that of Hau et al. because they are analogous in preventing aliasing in a signal. One in the art would have been motivated to incorporate the teaching, low pass filtering on an image signal, of Vetro et al. to the system of Hau et al. in order to perform prefiltering to remove some of the aliasing before processing the signal further (Vetro et al.; col. 13 lines 16-19).

B.) Claims 4, 23, and 38 are rejected under 35 U.S.C. 103(a) as being unpatentable over Hau et al. (U.S. patent 5,528,301) as modified by Vetro et al. (U.S. patent 6,519,288) and further in view of Streater (U.S. patent 5,831,677).

Regarding claims 4, 23, and 38: The method wherein the step of performing linear low-pass filtering on the digital input signal comprises a step of performing mean filtering on the digital input signal.

Hau et al. as modified by Vetro et al. gives a system where a input signal is prefiltered by a low pass filter in order to prevent aliasing to take place. Hau et al as modified by Vetro et al. does not teach to perform mean filtering on the input signal. Streater teaches to perform mean filtering on a signal (Streater; col. 15 lines 36-40). It would have been obvious to one skilled in the art to combine the teaching of Streater to that of Hau et al as modified by Vetro et al. because they are analogous in preventing aliasing in a signal. One in the art would have been motivated to incorporate the teaching, of mean filtering, of Streater to the system of Hau et al. as modified by Vetro et al. in order to prevent aliasing in high contrast areas in an image (Streater; col. 15 lines 38-40).

C.) Claims 5, 6, 24, 25, 39, and 40 are rejected under 35 U.S.C. 103(a) as being unpatentable over Hau et al. (U.S. patent 5,528,301) in view of Faroudja et al. (U.S. patent 5,844,617).

Regarding claims 5, 6, 24, 25, 39, and 40: The method wherein the step (C) comprises steps of:

(C)(1) up-sampling the filtered reduced resolution signal to produce an up-sampled filtered signal; and

(C)(2) performing linear low-pass filtering on the up-sampled filtered signal to produce the digital output signal.

Hau et al. discloses to perform filtering on a signal for format conversion where the signal is first decimated passed through a bandwidth filter and then interpolation/upsampling performed on the filtered signal (Hau et al.; fig. 1, the interpolation is read as upsampling since missing pixels are filled in which in turn increases the number of pixels in the signal). Hau et al. does not teach to perform linear low pass filtering on a upsampled signal. Faroudja et al. teaches to perform filtering on a television signal that has undergone interpolation/upsampling (Faroudja; fig. 1B element 8 and col. 5 lines 11-22, where a Gaussian filter/low pass filter is used to filter the television signal components). It would have been obvious top one skilled in the art to combine the teaching of Faroudja et al. to that of Hau et al. because they are analogous in preventing artifacts in a television signal. One in the art would have been motivated to incorporate the linear low pass filtering of an interpolated/upsampled signal of Faroudja et al. to that of Hau et al. in order obtain a signal with without visually undesirable artifacts being produce due to format conversion (Faroudja et al.; col. 2 lines 14-18).

D.) Claims 7-10, 26-29, and 41-44 are rejected under 35 U.S.C. 103(a) as being unpatentable over Hau et al. (U.S. patent 5,528,301) in view of Vetro et al. (U.S. patent 6,519,288) and Faroudja et al. (U.S. patent 5,844,617).

Regarding claims 7, 26, and 41: They are rejected for the combination of claims 1, 3, and 5. A method for filtering a digital input signal to produce a digital output signal, the method comprising steps of:

Regarding claims 8-10, 27-29, and 42-44: The method of claim 7, wherein the step (B) comprises a step of: They are rejected for the same reason as claism 3, 22, and 37 above and for the limitations of a down sampling and up sampling factors to perform the respective samplings as well as these factors being equal:

Hau et al. as modified by vetro and Faroudja results in a signal being low passed filtered, decimated, then bandwidth filtered, then interpolated/upsampled, and then low passed filtered again to remove any artifacts in an image signal. None teach to have a respective down sampling and up sampling factor and for them to have a equal value. It is obvious to one skilled in the art that in order to down sample or up sample an image signal there must be a set factor to either down sample and/or up sample a signal a specific amount depending on the devices applied in the system. If an input device has a specific resolution and an output device has another resolution, higher or lower than the input device, then the down sampling and /or up sampling factors must be different so that the correct resolution of the output device can be obtained. If the resolution of the

input device is the same as the output device then the down sampling and up sampling factors must be set to equal values.

E.) Claims 13-19, 30-34, and 45-49 are rejected under 35 U.S.C. 103(a) as being unpatentable over Rhodes (U.S. patent 5,841,480) and Hau et al. (U.S. patent 5,528,301)

Regarding claims 13, 30, and 45: Rhodes discloses a method for producing a second digital image from a first digital image, the first digital image including a luminance signal, a first chrominance signal, and a second chrominance signal, the second digital image including the luminance signal, a first filtered chrominance signal, and a second filtered chrominance signal, the method comprising steps of (Rhodes; fig. 4 elements 411 and 421-423 and col.1 lines 18-25, where a image in one format is being converted to another format, which is read as 1st and 2nd images respectively because they are being converted from one form to another):

Rhodes discloses to perform signal conversion from one format to another by decomposing the signal into RGB components then transforming these components in luminance and chrominance and applying anti-aliasing filters to each channel to remove aliasing and then finally combining the signals to obtain the format required (Rhodes; fig. 3, fig. 4 elements 411, 421-423, 440, fig. 5 elements 540, 521-523, and 511). Rhodes further teaches where antialiasing filters are applied to each chrominance signal as well as to the luminance signal.

Rhodes does not teach where these anti-aliasing filters first down sample the signal, then pass the signal through a median filter, and then finally perform interpolation on the signal. Hau et al. teaches a specfic type of anti-aliasing filter where a signal is first decimated/down sampled, then processed through a bandwidth filter (wherein in a median filter is read as a bandwidth filter), and finally interpolation is performed on the filtered signal (Hau et al.; fig. 1). It would have been obvious to one skilled in the art to combine the teaching of Hau et al. to that of Rhodes because they are analogous in removing aliasing in format conversion of a signal. It would have been obvious to one skilled in the art to substitute the anti-aliasing filters of Hau et al. for the ones of the system of Rhodes depending on the aliasing/ artifacts present in the image signal. One in the art would have configured the system depending on the artifacts and aliasing present in a signal such as applying a filter to all the chrominance and luminance channels or just on the chrominance channels and none on the luminance channel.

Regarding claims 14, 31, and 46: The method wherein the first digital image is encoded according to a first color space, and wherein the method further comprises a step of:

(C) converting a third digital image encoded according to a second color space into the first digital image. Converting an image by using color spaces is a well known technique in image processing. Examiner takes official notice.

Regarding claim 15: The method wherein the first color space comprises a luminance-chrominance color space, and wherein the second color space comprises an RGB color space. (Rhodes; fig. 4 element 411 and fig. 5 element 511, where the input color space is either luminance and chrominance or RGB and the output color space is the reverse of what was inputted. It is a matter of configuration of applying/setting the specific color spaces depending on the devices in the system.

Regarding claims 16, 32, and 47: The method of wherein the step (C) comprises steps of:

(C)(1) subtracting a green color signal of the third digital image from a red color signal of the third digital image to produce the first chrominance signal of the first digital image (Rhodes; fig. 4 element 411, col. 9 lines 63-66, and col. 11 lines 36-45, where the chrominance signals, Cr and Cb, are obtained by differencing the luminance component, green color, from the red and blue color components respectively);

(C)(2) subtracting the green color signal of the third digital image from a blue color signal of the third digital image to produce the second chrominance signal of the first digital image (Rhodes; fig. 4 element 411, col. 9 lines 63-66, and col. 11 lines 36-45, where the chrominance signals, Cr and Cb, are obtained by differencing the luminance component, green color, from the red and blue color components respectively); and

(C)(3) providing the green color signal as the luminance signal of the first digital image. It is rejected for the same reason as claim 13, 30, and 45 above where a filter may or may not be applied to the luminance channel. If no filter is applied then the luminance channel is provided exactly as is with no change in the signal.

Regarding claims 17, 33, and 48: The method of claim 14, further comprising a step of:

(D) converting the second digital image into a fourth digital image encoded according to a third color space. Converting an image by using color spaces is a well known technique in image processing. Examiner takes official notice.

Regarding claims 18: The method of claim 17, wherein the first color space comprises a luminance-chrominance color space, and wherein the third color space comprises an RGB color space (Rhodes; fig. 4 element 411 and fig. 5 element 511, where the input color space is either luminance and chrominance or RGB and the output color space is the reverse of what was inputted. It is a matter of configuration of applying/setting the specific color spaces depending on the devices in the system.

Regarding claims 19, 34, and 49: The method wherein the step (D) comprises steps of:

(D)(1) adding the first filtered chrominance signal to the luminance signal to produce a red color signal of the fourth digital image (Rhodes; fig. 5 element 511 and col. 12 lines 35-40, where the luminance and chrominance components

are converted back to RGB by adding the luminance, green component, to the chrominance components, in order to obtain the red and blue colors);

(D)(2) adding the second filtered chrominance signal to the luminance 5 signal to produce a blue color signal of the fourth digital image; and

(D)(3) providing the luminance signal as a green color signal of the fourth digital image. It is rejected for the same reason as claim 13, 30, and 45 above where a filter may or may not be applied to the luminance channel. If no filter is applied then the luminance channel is provided exactly as is with no change in the signal.

Conclusion

8. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

Park et al. (U.S. patent 6,577,352) for filtering the chrominance signals of an image.

Finger et al. (U.S. patent 5,919,137) for a system for filtering an image to reduce the artifacts in the image.

Prabhakar et al. (U.S. patent 5,832,120) for antialiasing a signal by upsampling and down sampling the signal.

Contact Information

9. **THIS ACTION IS MADE FINAL.** Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

SAMIR AHMED
PRIMARY EXAMINER

AB

Anand Bhatnagar

Art Unit 2623

April 19, 2004